UNITED STATES PATENT APPLICATION

For

SYSTEM AND METHOD TO FACILITATE TRANSLATION OF COMMUNICATIONS BETWEEN ENTITIES OVER A NETWORK

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SYSTEM AND METHOD TO FACILITATE TRANSLATION OF COMMUNICATIONS BETWEEN ENTITIES OVER A NETWORK

FIELD OF THE INVENTION

[0001]   The present invention relates generally to the field of network-based communications and, more specifically, to a system and method to facilitate translation of communications between entities over a network, such as the Internet.

BACKGROUND OF THE INVENTION

[0002]   The explosive growth of the Internet as a publication and interactive communication platform has created an electronic environment that is changing the way business is transacted. As the Internet becomes increasingly accessible around the world, communications between users that utilize different spoken or written languages increase exponentially.

[0003]   Several attempts have been made to facilitate such communications and to provide translation software packages residing on a computer and configured to translate text or voice communications from one language to another. Some of these translation software packages, however, can be expensive and can result in a financial burden for a user of such software packages. Furthermore, such software packages require considerable storage capacity to be available on the computer.

[0004]   Another drawback of the translation software packages relates to their limited applicability. For example, current technology allows for translation of text through common text translation software installed on a computer. The translation may be accomplished in a variety of ways, one of which is direct word for word translation of the communication, which is imperfect and produces grammatically incorrect sentences in the translated language. Current technology also allows for limited translation of voice communications through speech recognition software installed on the computer. However, spoken language translation is mostly available in restricted domains, where the database of recognizable words is limited to a specific set of words.

SUMMARY OF THE INVENTION

[0005]	A system and method to facilitate translation of communications between entities over a network are described. Multiple predetermined language constructs are communicated to a first entity as a first transmission over the network. Responsive to selection by the first entity of a language construct from the predetermined language constructs, a translated language construct corresponding to the selected language construct is identified. Finally, the translated language construct is communicated to a second entity as a second transmission over the network.

[0006]	Other features and advantages of the present invention will be apparent from the accompanying drawings, and from the detailed description, which follows below.

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BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The present invention is illustrated by way of example and not intended to be limited by the figures of the accompanying drawings in which like references indicate similar elements and in which:

[0008] **Figure 1** is a block diagram illustrating an exemplary network-based transaction facility in the form of a network-based auction facility.

[0009] **Figure 2** is a block diagram illustrating an exemplary database, maintained by and accessed via a database engine server, which at least partially implements and supports the auction facility.

[0010] **Figure 3A** illustrates an exemplary stored constructs table.

[0011] **Figure 3B** illustrates an exemplary stored translated constructs table.

[0012] **Figure 4** is an interaction diagram illustrating a sequence of interactions, according to an exemplary embodiment of the present invention, to facilitate translation of communications between entities over a network.

[0013] **Figure 5** is a block diagram illustrating an exemplary environment in which the interaction sequence illustrated in Figure 4 may be employed.

[0014] **Figure 6** is a flow chart illustrating a method, according to an exemplary embodiment of the present invention, to facilitate translation of communications between entities over a network.

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[0015]   **Figure 7** is a diagrammatic representation of a machine in the

exemplary form of a computer system within which a set of instructions may be

executed.

DETAILED DESCRIPTION

[0016]   A system and method to facilitate translation of communication between entities over a network are described. In the following detailed description of embodiments of the invention, reference is made to the accompanying drawings in which like references indicate similar elements, and in which are shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that logical, mechanical, electrical, functional, and other changes may be made without departing from the scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims.

[0017]   **Figure 1** is a block diagram illustrating an exemplary network-based transaction facility in the form of a network-based auction facility 10. While an exemplary embodiment of the present invention is described within the context of an auction facility, it will be appreciated by those skilled in the art that the invention will find application in many different types of computer-based, and network-based, commerce facilities.

[0018]   The auction facility 10 includes one or more of a number of types of front-end servers, namely communications servers in the exemplary form of

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page servers 12 that deliver web pages to multiple entities (e.g., markup language documents), picture servers 14 that dynamically deliver images to be displayed within the web pages, listing servers 16, processing servers in the exemplary form of Common Gateway Interface (CGI) or Internet Server Application Program Interface (ISAPI) servers 18 that provide an intelligent interface to the back-end of the auction facility 10, and search servers 20 that handle search requests to the auction facility 10. In addition, the auction facility 10 includes e-mail servers 21 that provide, *inter alia*, automated e-mail communications to/from entities of the facility 10.

[0019]   The auction facility 10 further includes one or more back-end servers, for example a database engine server 22, a search indexer server 24 and a credit card database server 26, each of which maintains and facilitates access to a respective database 23. The network-based auction facility 10, such as an Internet-based auction facility 10, may be accessed by a client program 30, such as a browser (e.g., the Internet Explorer browser distributed by Microsoft Corporation of Redmond, Washington) that executes on a client machine 32 and accesses the facility 10 via a network 34, such as, for example, the Internet. Other examples of networks that a client may utilize to access the auction facility 10 includes a wide area network (WAN), a local area network (LAN), a wireless network (e.g., a cellular network), or the Plain Old Telephone Service (POTS) network.

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[0020]   **Figure 2** is a block diagram illustrating an exemplary database 23,

maintained by and accessed via the database engine server 22, which at least

partially implements and supports the auction facility 10. The database 23 may,

in one embodiment, be implemented as a relational database, and includes a

number of tables having entries, or records, that are linked by indices and keys.

In an alternative embodiment, the database 23 may be implemented as a

collection of objects in an object-oriented database.

[0021]   Central to the database 23 shown in **Figure 2** is a user table 40,

which contains a record for each entity or user of the auction facility 10. Each

user may operate as a seller, a buyer, or both, within the auction facility 10. The

database 23 also includes items tables 42 that may be linked to the user table 40.

Specifically, the table 42 includes a seller items table 44 and a bidder items table

46. A user record in the user table 40 may be linked to multiple items that are

being, or have been, auctioned via the auction facility 10. A link indicates

whether the user is a seller or a bidder (or buyer) with respect to items for which

records exist within the items table 42.

[0022]   The database 23 further includes a note table 48 populated with

note records that may be linked to one or more item records within the items

table 42 and/or to one or more user records within the user table 40. Each note

record within the note table 48 may include, *inter alia*, a comment, description,

history, or other information pertaining to an item being auctioned via the

auction facility 10, or pertaining to a user of the auction facility 10.

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[0023]   A number of other tables are also shown to be linked to the user table 40, such as a user past aliases table 50, a feedback table 52, a bids table 54, an accounts table 56, and an account balances table 58.

[0024]   The database 23 is also shown to include two tables specifically to enable an exemplary embodiment of the present invention. A stored construct table 60 stores a predetermined number of language constructs, such as sentences, phrases, questions, or any other known types of language constructs. A stored translated construct table 70 contains a number of records, each record storing translated language constructs corresponding to the language constructs stored in table 60. Prior to any communication between client 32 and the network-based auction facility 10, each translated language construct is generated and stored in the stored translated construct table 70, and the correspondence to one or more predetermined language constructs in the stored language constructs table 60 is defined, such that each translated language construct includes a predetermined translation of the corresponding predetermined language construct.

[0025]   **Figure 3A** illustrates an exemplary embodiment of a stored construct table 60. As illustrated in **Figure 3A**, the table 60 includes a construct ID field 62 to store a unique identifier for each stored language construct to be used in an exemplary embodiment of the present invention. The table 60 further includes a construct field 64 to store each language construct maintained within the database 23.

[0026]   Figure 3B illustrates an exemplary embodiment of a stored

translated construct table 70. As illustrated in **Figure 3B**, the table 70 includes a

construct ID field 72 to store a unique identifier for each translated language

construct, which corresponds to the identifier of the language construct stored

within field 62. The table 70 further includes a language ID field 74 to store an

identifier for a language pertaining to the translated construct, and a translated

construct field 76 to store the translated construct in the particular language

identified in the language ID field 74.

[0027]   **Figure 4** is an interaction diagram illustrating a sequence 90 of

interactions, according to an exemplary embodiment of the present invention, to

facilitate translation of communications between entities in the exemplary form

of a first user 92 and a second user 94. While the sequence 90 describes a client-

server environment, whereby communications between the first and second

users 92 and 94 are facilitated by, or performed through, a website 96, it will also

be appreciated that the teachings of the present inventions may be applied to a

peer-to-peer environment, whereby the users 92 and 94 communicate directly

and not through the website 96.

[0028]   As illustrated in **Figure 4**, the sequence 90 commences at block 105

with the selection by the first user 92 of a language construct and of a user

identifier of the second user 94. The language construct may be selected, in one

embodiment, from a drop-down list containing multiple predetermined

language constructs, the drop-down list being displayed in a first interactive area

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of a web form communicated to the first user 92 from the website 96.

Alternatively, the language construct may be selected from a window, which presents the web form containing the predetermined language constructs to the first user 92. The predetermined language constructs are generated and stored in the stored constructs table 60 of the database 23 prior to being communicated to the first user 92 in the drop-down list or web form.

[0029]   At block 110, the language construct is communicated from the first user 92 to the website 96 via the network 34 in a message directed to the second user 94, for example an electronic mail (e-mail) message.

[0030]   At block 115, the website 96 (e.g., the auction facility 10) utilizes the search servers 20 to conduct a search of the user table 40, the stored constructs table 60, and the stored translated constructs table 70 to retrieve a translated language construct, based on the user identifier corresponding to the second user 94. The search of the user table 40 locates the user information pertaining to the second user 94, including a language preference of the second user 94, and the search of the tables 60 and 70 locates the translated language construct corresponding to the selected language construct and the language preference of the second user 94. In one embodiment, the predetermined language constructs and the translated language constructs are generated and stored in respective tables 60 and 70 prior to the language constructs being communicated to the first user 92, so as to define a correspondence between each predetermined language construct and at least one associated translated language construct.

Alternatively, the storing is so as to define a correspondence between a set of the translated language constructs, wherein each translated language construct of the set includes a predetermined translation of a common underlying language construct.

[0031]   At block 120, the website 96 generates a translated message to be transmitted to the second user 94. In one embodiment, the translated message is an e-mail message generated by the e-mail servers 21 and directed to the second user 94, which contains the translated language construct. Alternatively, the translated e-mail message may contain multiple interactive fields to allow the second user 94 to respond to the first user 92.

[0032]   At block 125, the translated message is communicated to the second user 94. In one embodiment, an e-mail message containing the translated language construct is communicated by the e-mail servers 21 to the second user 94.

[0033]   At block 130, the second user 94 selects a further language construct and a user identifier of the first user 92 to which the further language construct is to be communicated. The further language construct may be selected, in one embodiment, from a drop-down list containing multiple predetermined language constructs translated in the language preference of the second user 94, the drop-down list being displayed in one interactive field of the multiple fields communicated to the second user 94 from the website 96.

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Alternatively, the second user 94 may only receive the translated message from the website 96 and take no further action.

[0034]   At block 135, the further language construct is communicated from the second user 94 to the website 96 via the network 34 in a reply message directed to the first user 92, for example an electronic mail (e-mail) message.

[0035]   At block 140, the website 96 (e.g., the auction facility 10) utilizes the search servers 20 to conduct a search of the user table 40, the stored constructs table 60, and the stored translated constructs table 70 to retrieve a translated further language construct, based on the user identifier corresponding to the first user 92. The search of the user table 40 locates the user information pertaining to the first user 92, including a language preference of the first user 92, and the search of the tables 60 and 70 locates the translated further language construct corresponding to the selected further language construct and the language preference of the first user 92.

[0036]   At block 145, the website 96 generates a translated reply message to be transmitted to the first user 92. In one embodiment, the translated reply message is an e-mail message generated by the e-mail servers 21 and directed to the first user 92, which contains the translated further language construct.

[0037]   At block 150, the translated reply message is communicated to the first user 92. In one embodiment, an e-mail message containing the translated further language construct is communicated by the e-mail servers 21 to the first user 92.

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[0038]   It should be noted that the sequence 90 may have any one of a number of applications and may be implemented within any number of environments. For example, the sequence 90 may be used to communicate information from any one entity, such as first or second users 92 and 94, to the website 96 in a language preferred by the respective entity. The website 96 may subsequently translate the information and use it in any one of a number of applications, such as in the preparation of item listings, or in the updating of the user information.

[0039]   Figure 5 is a block diagram illustrating an exemplary environment in which the interaction sequence 90 may be employed. As illustrated in Figure 5, client machines 32 are shown to reside outside the context of a website, such as the exemplary website 96 shown in Figure 4. Accordingly, this embodiment describes an application which allows a first user of a client machine 32, such as the first client machine 32, to communicate language constructs to a second user of a further client machine 32, such as the second client machine 32, both of which reside outside the website 96 or any other commerce facility. Alternatively, each user of the client machines 32 may only communicate language constructs to the website 96 in order to request performance of applications by the website 96.

[0040]   Referring to Figure 5, the first user selects a language construct and a user identifier of the second user in an e-mail client or browser 322 that executes in the first client machine 32, the second user being the recipient of an e-

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mail message 324 containing the language construct to be communicated by the first user. The language construct may be selected, in one embodiment, from a drop-down list containing multiple predetermined language constructs, the drop-down list being displayed in a first interactive area of a web form communicated to the first user from the website 96. Alternatively, the language construct may be selected from a window, which presents the web form containing the predetermined language constructs to the first user.

[0041] The message is shown to be communicated to the e-mail servers 21 of the website 96. Specifically, the message containing the language construct may be communicated, in one embodiment, as an e-mail message or by utilizing any other transfer protocol or communication. The e-mail servers 21 receive the message using the transmission functions 217 and proceed to parse the message to extract the language construct and the user identifier for the second user that operates the second client machine 32.

[0042] The search servers 20 within the website 96 receive the language construct and the user identifier and search tables within corresponding databases using search functions 205 to provide a translated language construct to be communicated to the second user. Specifically, in one embodiment, the search servers 20 search the user table 40 shown in **Figure 2** to locate user information pertaining to the second user, including a language preference of the second user. The search servers 20 further search the stored constructs table 60 and the stored translated constructs table 70 shown in **Figure 2** to locate the

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translated language construct corresponding to the selected language construct and the language preference of the second user.

[0043] The translated language construct is subsequently communicated to the e-mail servers 21. The e-mail servers 21 generate a translated e-mail message containing the translated language construct using message generation functions 215. The translated e-mail message is then communicated to the second client machine via the transmission functions 217.

[0044] In one embodiment, the second user selects a further language construct and a user identifier of the first user in an e-mail client or browser 326 that executes in the second client machine 32, the first user being the recipient of a reply e-mail message 328 containing the further language construct to be communicated by the second user. The language construct may be selected, in one embodiment, from a drop-down list containing multiple predetermined language constructs translated in the language preference of the second user, the drop-down list being displayed in one interactive field of multiple interactive fields that may be communicated to the second user from the website 96. Alternatively, the second user may only receive the translated e-mail message and take no further action.

[0045] The reply message is shown to be communicated to the e-mail servers 21 of the website 96. Specifically, the reply message containing the further language construct may be communicated, in one embodiment, as an e-mail message or by utilizing any other transfer protocol or communication. The

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e-mail servers 21 receive the reply message using the transmission functions 217 and proceed to parse the reply message to extract the further language construct and the user identifier for the first user that operates the first client machine 32.

[0046]   The search servers 20 within the website 96 receive the further language construct and the user identifier and search tables within corresponding databases using search functions 205 to provide a translated further language construct to be communicated to the first user. Specifically, in one embodiment, the search servers 20 search the user table 40 shown in **Figure 2** to locate user information pertaining to the first user, including a language preference of the first user. The search servers 20 further search the stored constructs table 60 and the stored translated constructs table 70 shown in **Figure 2** to locate the translated further language construct corresponding to the selected further language construct and the language preference of the first user.

[0047]   The translated further language construct is subsequently communicated to the e-mail servers 21. The e-mail servers 21 generate a translated reply message containing the translated further language construct using message generation functions 215. The translated reply message is then communicated to the first client machine via the transmission functions 217.

[0048]   An alternative application would allow each user of the first or second client machines 32 to communicate selected language constructs to the website 96. In this case, the website 96 may perform search and translation

operations and use the translated language construct to update listings via listing servers 16, or to update user information in the user table 40.

[0049]   Figure 6 is a flow chart illustrating a method, according to an exemplary embodiment of the present invention, to facilitate translation of communications between entities over a network. It will be appreciated that the method may, as described above, be utilized to facilitate translation of communications, and is not limited to the context of a network-based auction facility.

[0050]   As illustrated in Figure 6, at processing block 610, a web form containing language constructs is communicated to the first user. At processing block 615, a selected language construct and a user identifier of the second user are received from the first user.

[0051]   At processing block 620, the user table 40 is searched to locate user information pertaining to the second user, including a language preference of the second user. At processing block 625, the stored constructs table 60 and the stored translated constructs table 70 are searched to retrieve a translated language construct corresponding to the selected language construct.

[0052]   At processing block 630, a translated message containing the translated language construct and multiple interactive fields is generated. At processing block 635, the translated message is communicated to the second user.

[0053]   At processing block 640, a further language construct and a user identifier of the first user are received from the second user. At processing block

645, the user table 40 is searched to locate user information pertaining to the first

user, including a language preference of the first user. At processing block 650,

the stored constructs table 60 and the stored translated constructs table 70 are

searched to retrieve a translated further language construct corresponding to the

selected further language construct.

[0054]   At processing block 655, a translated reply message containing the

translated further language construct is generated. Finally, at processing block

660, the translated reply message is communicated to the first user.

[0055]   **Figure 7** shows a diagrammatic representation of a machine in the

exemplary form of a computer system 300 within which a set of instructions, for

causing the machine to perform any one of the methodologies discussed above,

may be executed. In alternative embodiments, the machine may comprise a

network router, a network switch, a network bridge, Personal Digital Assistant

(PDA), a cellular telephone, a web appliance or any machine capable of executing

a sequence of instructions that specify actions to be taken by that machine.

[0056]   The computer system 300 includes a processor 302, a main memory

304 and a static memory 306, which communicate with each other via a bus 308.

The computer system 300 may further include a video display unit 310 (e.g., a

liquid crystal display (LCD) or a cathode ray tube (CRT)). The computer system

300 also includes an alphanumeric input device 312 (e.g., a keyboard), a cursor

control device 314 (e.g., a mouse), a disk drive unit 316, a signal generation

device 18 (e.g., a speaker), and a network interface device 320.

[0057]   The disk drive unit 316 includes a machine-readable medium 324 on which is stored a set of instructions (i.e., software) 326 embodying any one, or all, of the methodologies described above. The software 326 is also shown to reside, completely or at least partially, within the main memory 304 and/or within the processor 302. The software 326 may further be transmitted or received via the network interface device 320.

[0058]   It is to be understood that embodiments of this invention may be used as or to support software programs executed upon some form of processing core (such as the CPU of a computer) or otherwise implemented or realized upon or within a machine or computer readable medium. A machine readable medium includes any mechanism for storing or transmitting information in a form readable by a machine (e.g., a computer). For example, a machine readable medium includes read-only memory (ROM); random access memory (RAM); magnetic disk storage media; optical storage media; flash memory devices; electrical, optical, acoustical or other form of propagated signals (e.g., carrier waves, infrared signals, digital signals, etc.); or any other type of media suitable for storing or transmitting information.

[0059]   In the foregoing specification, the invention has been described with reference to specific exemplary embodiments thereof. It will, however, be evident that various modifications and changes may be made thereto without departing from the broader spirit and scope of the invention as set forth in the

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appended claims. The specification and drawings are, accordingly, to be

regarded in an illustrative sense rather than a restrictive sense.